REMARKS

This application has been carefully reviewed in light of the Office Action dated June 4, 2007. Applicant has added claims 10-12. Reconsideration and favorable action in this case are respectfully requested.

The Examiner has rejected claims 1-9 under 35 U.S.C. §103(a) as being unpatentable over over U.S. Pat. No. 5,986,640 to Baldwin in view of U.S. Pat. No. 5,751,379 to Markandey. Applicants have reviewed these references in detail and do not believe that they disclose or make obvious the invention as claimed.

In the current Office Action, the Examiner notes that Baldwin does not teach displaying the bits of the image word in the same predetermined relative temporal order for each refresh period.

As previously noted by Applicants with regard to Baldwin, the split time units are mirrored around the COI – i.e., the viewer sees the bits displayed in a first order for a first refresh period and in a second, *opposite*, order for the second refresh period. In the present invention, however, the bits of the image word are seen by the viewer in the same relative temporal order for each of the at least two refresh periods.

The distinction between Baldwin and the present invention has real-world consequences which affect the quality of the image received by the viewer. In each case, the viewer will see a pattern repeated. Using a display device of the type taught by Baldwin, the view sees a pattern that repeats at the *frame rate*. In the present invention, the pattern repeats at the *refresh rate*. Using two refresh periods per frame, the invention would have a pattern that repeats twice as fast as the frame rate. Thus, *flickering* will be much less noticeable.

The Examiner claims that Markandey teaches a system where the bits are displayed in the same order from [bit positions] 7-1 for each frame period, concluding that it would

be obvious to one of ordinary skill in the art at the time the invention was made to include the same order for the bits in each frame as taught by Markandey in to the display method of Baldwin, as by displaying in the same order Markandey allows the used of higher number of bits to avoid *contouring and artifacts* in the final displayed image and does not require high transition of switching time of the spatial light modulator elements.

Applicants disagree on a number of levels. First, it is important to review exactly what Markandey teaches and what it does not. Markandey using m bits per sample to digitize the incoming data but apportions the LSB times for pulse width modulation based on m-1 bits. Video frames are displayed using m bits and m-1 bits in alternate fashion – if the current frame uses m bits, then the next frame uses m-1 bits (leaving off the lowest bit), then m bits again, and so on. The LSBs (i.e., the minimum time period for a bit) are apportioned on an m-1 basis – hence, if m=8, a frame time period will be allocated among 127 (i.e., 2^{m-1}) LSBs, not 256 LSBs. Therefore, bit 8 has a time period equal to 64/127 of a frame period, bit 7 has a time period equal to 32/127 of a frame period, and so on (col. 3, lines 3-19).

When a frame using the full m bits is displayed, bit 0 has a time period which is the same as bit 1. Markandey suggests two solutions for allocating the time associated with the additional LSB. One solution is to divide the first frame time into 127 LSBs and the second frame time into 128 LSBs, so that the allocation of time to the bits in the image word will depend on whether the image word is displayed as a (m-1) bit frame or as a m-bit frame. The second solution is to divide both the first and second frames into 128 LSBs and not display video of a one LSB time period during a m-1 frame.

In either case, bit 0 of an m-bit frame will be displayed twice as long as intended, while bit 0 of a (m-1)-bit frame will not be displayed at all.

With regard to using the Markandey reference in conjunction with the Baldwin reference, there would be no reason to combine the two references, since Markandey does

not propose any solutions for *flicker*. Markandey teaches a system for displaying sequential frames, not for displaying the same frame multiple times. Markandey alternates image words between m-bit and (m-1)-bit words as a compromise between reducing *artifacts and contouring* using an m-bit word, and reducing timing constraints using an (m-1)-bit word. However, Markandey would do nothing to reduce flicker, because it does not display an image associated with a single image data word multiple times in succession. Therefore, one skilled in the art would not look to Markandey to improve on the system of Baldwin.

Furthermore, Baldwin specifically and intentionally arranges the split time units to be symmetrical about a "center of illumination" or "COI". Changing the order of bits to repeat, rather than be symmetrical about the COI, would be contrary to the very outcome that Baldwin attempts to achieve.

Accordingly, since there would be no reason to combine the teaching of Baldwin and Markandey, and because the teaching of Markandey as used by the Examiner would be contrary to the teachings of Baldwin, Applicants respectfully request that the 103(a) rejection be withdrawn.

With regard to claim 2, the determining step requires a determination of a minimum temporal frequency for each of the image data bits, where the minimum temporal frequency is that necessary to prevent the image data bit from appearing to flicker.

The Examiner states that Baldwin teaches that the display periods are allocated to prevent flicker. However, nothing in Baldwin suggests that a minimum temporal frequency is determined; it is simply assumed that the sub-frames will be sufficient to reduce flicker.

Accordingly, Applicants respectfully request allowance of claim 2 as novel and unobvious over Baldwin and Markandey.

Also, as noted above, Markandey results in a situation where either every other frame has a time period in which either (1) no image data is shown or (2) alternating words use different allocations of the frame period. In either case, if the teachings of Markandey were used to show the same frame multiple times, the times allocated to each bit of the image frame word would be skewed because of the allocation of the extra LSB for every other frame.

In this regard, Applicants have added dependent claims 10-12. Claim 10 requires that each bit of the data word has an associated time period within the image frame period and wherein … an accumulated time period associated with each bit over all the refresh periods equals the associated time period for the bit, although not all bits of the image data word are displayed in each refresh period… . This could not be achieved for a combination of Baldwin and Markandey as Markandey uses either (1) a blank period for every two frames or (2) allocates consecutive frames differently.

Therefore, Applicant believes that the invention as described in connection with claims 10-12 is novel and unobvious over the prior art.

An extension of two months is requested and a Request for Extension of Time under § 1.136 with the appropriate fee is attached hereto.

The Commissioner is hereby authorized to charge any fees or credit any overpayment, including extension fees, to Deposit Account No. 20-0668 of Texas Instruments Incorporated.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Alan W. Lintel, Applicants'

Attorney at (972) 664-9595 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

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